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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,768	01/24/2006	Masaya Tamura	MAT-8806US	2985

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EXAMINER	
STEVENS, GERALD D	

ART UNIT	PAPER NUMBER
2817	

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10/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,768	TAMURA ET AL.	
	Examiner	Art Unit	
	GERALD STEVENS	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7 and 9-11* is/are rejected.

7)☒ Claim(s) *4-6 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US200376195) in view of Yamakazi et al (US 20020113666); both of record.

Regarding claim 1, Ishizaki, as depicted in fig. 7, teaches having a filter (filter 8b) passing fundamental frequencies and having an attenuation pole, the filter having a first impedance (pg. 1 par. 0014, wherein the filter structure inherently has an impedance);

an antenna switch circuit (switch 4) switching antennas which match the fundamental frequencies, the antenna switch circuit having a second impedance (wherein the switch circuit inherently has an impedance and it is inherent in the function of the diversity antenna module to switch to the antenna which matches the fundamental frequency of a signal, for example: Pietsch et al (US 6118409), col. 3 lines 37-41 teaches matching an antenna to a signal); and

an adjustment line conductor (directional coupler 13) connected between the filter (filter 8b) and the antenna switch circuit (switch 4),

but fails to teach the adjustment line conductor having a set length that adjusts properties at harmonic frequencies of the fundamental frequencies when the filter and the antenna switch circuit are connected with each other at a connection point on the adjustment line conductor, the set length of the adjustment line conductor preventing the first impedance and the second impedance from becoming complex conjugates of each other at the harmonic frequencies, and the first impedance and the second impedance being measured from the connection point.

Yamazaki, as depicted in fig. 1, teaches the adjustment line conductor (transmission line 105 & stubs 107 & 108) having a set length (wherein the open circuited stubs 107 & 108 each constitute a set length of ¼ wavelength, see pg. 2 par. 0048) that is used to adjust properties at harmonic frequencies of the fundamental frequencies (pg. 3 par. 0056).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have substituted the directional coupler such as taught by Ishizaki with the transmission line and stubs such as taught by Yamazaki because it is obvious to have substituted a specific art equivalent coupler such as taught in Yamazaki in the place of the generic equivalent coupler as shown in Ishizaki. Also, the stubs as disclosed in Yamazaki provide the benefit of suppressing unnecessary signals in a stop frequency (pg. 2 par. 0050).

Therefore, as an obvious consequence of the above combination, the filter (Ishizaki: fig. 7 filter 8b) and the antenna switch circuit (Ishizaki: fig. 7 switch 4) are connected with each other at a connection point (wherein a point along the first transmission line 105 constitutes the connection point) on the adjustment line conductor (Yamazaki: fig. 1 transmission line 105 & stubs 107 & 108, wherein the filter is connected to the directional coupler through the power amplifier 9b) and the set length of the adjustment line conductor (Yamazaki: fig. 1 transmission line 105 & stubs 107 & 108, wherein the open circuited stubs 107 & 108 constitute a set length of ¼ wavelength) prevents the first impedance and the second impedance from becoming complex conjugates of each other at the harmonic frequencies (wherein it would have been obvious to one having ordinary skill in the art that suppressing the harmonics of the filter (i.e. a first impedance) and the switch (i.e. a second impedance) would negate the output impedance of the filter and the input impedance of the switch from becoming complex conjugates of each other at harmonic frequencies since it is known in the art that the suppression of harmonic frequencies will eliminate their effective impedances), and the first impedance and the second impedance are measured from the connection point (wherein the impedance of the switch would be seen/measured from the left side of the transmission line 105/connection point and the impedance of the filter would be seen/measured from the right side of the transmission line 105/connection point).

Regarding claim 11, as an obvious consequence of modifying Ishizaki with Yamazaki such a combination further teaches a coupling line (fig. 1 transmission line 106) coupled with the adjustment line (fig. 1 transmission line 105 & stubs 107 & 108), wherein the coupling line and the adjustment line form part of a directional coupler (fig. 1 whole figure).

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) as applied to claim 1 above, and further in view of Yu (US 20040005867); all of record.

Regarding claim 2, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach a ground layer being divided into a ground layer for the filter and a ground layer for the antenna switch circuit.

Yu teaches a ground layer (fig. 2 ground connections “C-GND” “R-GND" & "T-GND") being divided into a ground layer (fig. 2 ground “T-GND”) for the filter (fig. 2 transmission filter “Tx filter”) and a ground layer (fig. 2 ground “C-GND’) for the antenna switch circuit (fig. 2 switch 36, pg. 2 par. 0034).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the portable phone terminal as taught by the above combination with the divided ground section as taught by Yu because the divided ground section disclosed in Yu provides the benefit of minimizing the

possibility of a radio frequency signal produced at the transmitter affecting the receiver (pg. 2 par. 0036).

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) and Yu (US 20040005867) as applied to claim 2 above, and further in view of Tai et al (US 7027779); all of record.

Regarding claim 3, the combination of Ishizaki, Yamazaki, and Yu teach all of the elements as discussed above in claim 2, but the combination fails to teach the antenna switch module including a laminated body formed of a plurality of dielectric layers.

Tai teaches the antenna switch module (fig. 7 whole figure) including a laminated body formed of a plurality of dielectric layers (fig. 9, wherein the figure is the exploded view of fig. 7, col. 12 lines 6-10).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the generic antenna switch circuit as taught by the above combination as a laminated body antenna switch module as taught by Tai because the laminated body disclosed in Tai provides the benefit of reducing the size of the high-frequency switch module (col. 2 lines 26-30).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) as applied to claim 1 above, and further in view of Tai et al (US 7027779); all of record.

Regarding claim 7, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach the antenna switch module including a laminated body formed of a plurality of dielectric layers.

Tai teaches the antenna switch module (fig. 7 whole figure) including a laminated body formed of a plurality of dielectric layers (fig. 9, wherein the figure is the exploded view of fig. 7, col. 12 lines 6-10).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the generic antenna switch circuit as taught by the above combination as a laminated body antenna switch module as taught by Tai because the laminated body disclosed in Tai provides the benefit of reducing the size of the high-frequency switch module (col. 2 lines 26-30).

6. Claims 9 & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) as applied to claim1 above, and further in view of Akiya (US 6236841); all of record.

Regarding claim 9, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach the antenna switch circuit including an antenna switch element which is a PIN diode. Akiya teaches the antenna switch circuit (fig. 3 switching circuit 4) including an antenna switch element which is a PIN diode (col. 5 lines 30-32).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the switching circuit as taught by the above combination with the PIN diode as taught by Akiya because it is obvious to substitute an art equivalent switch such as taught in Akiya in the place of the generic switch structure shown in Ishizaki.

Regarding claim 10, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach the antenna switch circuit including an antenna switch element which is a Gas switch.

Akiya teaches the antenna switch circuit (fig. 3 switching circuit 4) including an antenna switch element which is a GaAs switch (col. 5 lines 30-32).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the switching circuit as taught by the above combination with the GaAs switch as taught by Akiya because it is obvious to

substitute an art equivalent switch such as taught in Akiya in the place of the generic switch structure shown in Ishizaki.

Allowable Subject Matter

7. Claims 4-6 & 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed 07/16/2008 have been fully considered but they are not persuasive. Applicant argues that neither Ishizaki nor Yamazaki teaches having an adjustment line that has a set length that is used to ensure that the impedance of a filter is not the complex conjugate of the impedance of an antenna switch. Contrary to applicant's assertion, in the obviousness combination set forth above to reject claim 1, the first transmission line (105) and the two open-circuited stubs (107 & 108) of Yamazaki, as shown in fig. 1, constitutes the adjustment line that is connected between the filter (Ishizaki: fig. 7 filter 8b) and the antenna switch (Ishizaki: fig. 7 switch 4) in the combination. The stubs (107 & 108) have a stub length (i.e. a set length) that is 1/4 wavelength in a desired stop frequency (fs11), which cancels harmonic spurious to a directional coupler (Yamazaki: par. 0048 & 0056). This feature of having the stubs (107 & 108), which are apart of the adjustment line, located on the first transmission line (105) being located between the filter (Ishizaki: fig. 7 filter 8b) and the antenna switch (Ishizaki: fig. 7 switch 4) and used to cancel harmonic spurious provides the benefit of

suppressing the harmonics of the filter and the switch. And, when the harmonics of the filter and the switch are eliminated their impedances are also eliminated, which results in the impedances of the switch and filter being prevented from becoming complex conjugates of each other at harmonic frequencies.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD STEVENS whose telephone number is (571)270-5076. The examiner can normally be reached on Mon-Fri 7:30am - 5:00pm EST alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENNY LEE/
PRIMARY EXAMINER
ART UNIT 2817

GDS